

TO: INTERESTED PARTIES
FROM: JERI SCOTT, COMPLIANCE PROJECT MANAGER
DATE: July 29, 1999
SUBJECT: STAFF REVISED ANALYSIS

On July 9, 1999, the Central Valley Financing Authority and the Carson Energy Group filed revisions to their petition to amend the Commission Decision for the Carson Cogeneration Project (92-SPPE-1C). The original petition filed on April 12, 1999 contains a proposal by the project owner to modify the language in Condition of Exemption Air Quality One (AQ-1). The modification, if approved, will allow the project owner to increase the daily emission cap of the reactive organic compounds (ROCs) from a 96-pound/day (lb/day) limit to a 125-lb/day limit.

The revisions received on July 9th relate to the proposed mitigation for the increased ROC emission cap limit. In the original petition, the project owner and operator proposed to mitigate for the increased levels with excess air quality mitigation provided to the Campbell and Procter and Gamble projects. The owner and operator now propose to surrender banked ROC emission reduction credits in sufficient quantities to mitigate the increase.

Staff has revised its analysis to reflect the project owner and operator's new approach to mitigate the increase to the Carson project's daily ROC emission cap. Staff retains its original determination that, with sufficient mitigation, increasing the emission cap of the ROCs will not cause a significant impact on the environment. Based on our findings, we plan to recommend approval of the petition at the August 11, 1999 Business Meeting.

We have enclosed a copy of our revised analysis for your review. Your comments and questions are appreciated and must be received prior to the August 11, 1999 Business Meeting.

Please call me at (916) 654-4228 if you have questions regarding this memo or the Energy Commission amendment process. Technical questions should be directed to Mr. Matt Layton at (916) 654-3868.

Enclosure

AMENDMENT REQUEST TO INCREASE DAILY EMISSIONS LIMIT FOR REACTIVE ORGANIC COMPOUNDS, CARSON ENERGY GROUP COMBINED CYCLE COGENERATION FACILITY, 92- SPPE-1

Amendment Request

On April 12, 1999, the Carson Energy Group, the Carson Ice-Gen project operator, proposed an amendment to their Combined Cycle Cogeneration Facility, 92-SPPE-1, to increase the allowable daily facility emissions of reactive organic compounds (CEG 1999a). The applicant amended their proposal July 9, 1999, specifying that the proposed emissions increase, a potential ozone and particulate matter precursor will be mitigated by surrendering emission reduction credits (CEG 1999b).

Background

In October 1992, the Carson Energy Group (CEG) proposed to construct and operate the 99.3 megawatt (MW) Carson-Ice Project. The project was certified in June 1993 (CEC 1993) and ownership was transferred to the Central Valley Financing Authority, a joint powers agency composed of the Sacramento Municipal Utility District (SMUD) Board and one non-voting member of the Sacramento County Sanitation District.

The project, which is now built and operating, consists of one combustion turbine generator (CTG) combined cycle unit with a duct burner, one combustion turbine generator peaking unit, and one cooling tower. Two existing boilers and six digester gas flares at the adjacent wastewater treatment facility are included in the facility's emission caps. The fuel is a mixture of natural gas, and digester gas from the adjacent wastewater treatment facility.

Laws, Ordinances, Regulations, And Standards

Air Quality Condition of Certification AQ-1 (CEC 1993) sets emission limits for the facility's criteria air pollutant emissions. The emission limits are for nitrogen oxides (NO_x), carbon monoxide (CO), reactive organic compounds (ROC), sulfur oxides (SO_x), and particulate matter less than 10 microns (PM₁₀).

Analysis

The CEG is proposing a change to AQ-1, increasing the allowable facility emissions of ROC from the current limit of 96 pounds/day up to 125 pounds/day. All other air pollutant emission limits in AQ-1 will remain the same. CEG is not proposing any physical changes to the facility, stating that the ROC increase will allow additional hours of operation per day of the existing facility peaking turbine to meet the summer and daily peak electrical demands of the region served by SMUD (CEG 1999a). Currently, the CTG peaking unit is limited to roughly 10 hours of operation per day, if the other emission sources are on line and producing emissions that are part of the facility air pollutant mass emission caps in AQ-1 (CEG 1999a).

Peak electrical demand generally occurs during the afternoons, and mostly on hot summer days when the region also experiences high ambient ozone levels. Any emission increase of an ozone precursor, including ROC, particularly on an hourly or daily basis, needs to be analyzed to determine if the increase will cause, or contribute to, an existing violation of the state or federal 1-hour ozone standard. Additionally, ROC is a precursor to PM₁₀. Operating Carson's peaking combustion turbines to meet a daily peak demand during the winter PM₁₀ season needs to be analyzed to determine if the emission increase will cause, or contribute to, an existing violation of the state or federal ambient air quality 24-hour PM₁₀ standard.

Ambient Air Quality Setting

The Sacramento Metropolitan Air Quality Management District (District) encompasses all of Sacramento County. Sacramento generally experiences violations of the state and federal ozone standards during the summer months and violations of the state PM₁₀ standard during the winter months. Despite the continued growth in the number of industries, residents, and vehicle miles traveled in the county, average ambient air quality measurements are fairly level, suggested some successes from the implemented control measures.

Air Quality Table 1 shows the ambient air quality data from District monitoring stations close to the Carson Ice-Gen facility, and the maximum measurements for the county. The proximity of the monitoring stations to the emission source is generally not critical for ozone and PM₁₀ data since these pollutants have regional rather than localized effects. Table 1 also shows the number of days per year that the measured levels of an air pollutant exceed the standard. These continued violations, particularly of the state standards, suggest the need for continued control measures for PM₁₀ emissions, and for PM₁₀ and ozone precursor emissions from sources in the air basin. Sacramento County ambient Air quality measurements do not violate the federal 24-hr PM₁₀ standard.

Air Quality Table 1: SMAQMD Summary Air Quality Data

Pollutant	Year	1309 T Street	Elk Grove – Bruceville	H.D. Stockton	County Maximum	Days above NAAQS (a)	Days above CAAQS (b)
Ozone – ppm	1997	0.09	0.12	---	0.14	3	21
	1996	0.12	0.12	---	0.16	7	49
	1995	0.13	0.12	---	0.16	10	39
	1994	0.11	0.11	---	0.15	6	36
PM ₁₀ - µg/m ³	1997	108	---	107	108	0	6 (c)
	1996	75	---	86	86	0	12 (c)
	1995	85	---	74	85	0	17 (c)
	1994	99	---	94	104	0	13 (c)

- a. The National Ambient Air Quality Standard for 1-hr ozone is 0.12 ppm; for 24-hr PM10 it is 150 $\mu\text{g}/\text{m}^3$.
- b. The California Ambient Air Quality Standard for 1-hr ozone is 0.09 ppm; for 24-hr PM10 it is 50 $\mu\text{g}/\text{m}^3$.
- c. PM10 is measured every 6th day. The number of days above the standard could be 6 times the reported days.

Sources: CARB 1994, 1995, 1996, 1997

Amendment Description

The amendment proposes an increase in the Carson Ice-Gen facility ROC emission limit by 29 pounds per day (see Air Quality Table 2). The increase will allow CEG, or effectively SMUD, through its joint power ownership of Carson Ice-Gen, to operate the peaking unit more hours and thus provide more peak power to its service area.

Air Quality Table 2: Carson Ice-Gen Project Air Pollutant Emissions (lb/day)

Pollutant	Proposed Permit Limits	Current Permit Limits	Potential Emission Increases (a)
ROC	125	96	29
a. The potential emissions increase is the proposed permit level less the current permit limit and less proposed mitigation.			

Source: CEG 1999a

Impacts and Mitigation

The amendment proposes a ROC increase for the entire Carson facility, not just for the peaking unit alone. The facility also includes the combined cycle combustion turbines, the duct burner in the heat recovery steam generators, two boilers, and six flares. The peaking unit currently uses natural gas only¹; the other facility emission sources use a mixture of natural gas and digester gas from the adjacent wastewater treatment facility. Therefore, the ROC emission cap for the facility includes natural gas and digester gas combustion by-products, which are potential ozone and PM10 precursors, with varying levels of reactivity.

ROC emissions are not criteria pollutants, and are generally not modeled for direct impacts. However, ROCs, as precursors to ozone and PM10, are regulated to obtain, or maintain, compliance with ambient ozone and PM10 standards for an area. It is not practical to do ozone or PM10 impact modeling of ROC emissions from a single source. Nor is it appropriate for this amendment to require extensive regional PM or ozone modeling of an entire air basin. However, any increase of an ozone or PM10 precursor, on a daily basis, could cause or contribute to an existing violation of the state or federal ozone or PM10 standards.

¹ The District Permit to Operate states that the peaking unit is natural gas-fired and that, while not currently configured, has the ability to fire on digester gas (District 1999).

Therefore, since the increase in facility ROC emissions on a daily basis could contribute to ozone or PM10 formation, it could contribute to violations of the 1-hour and 24-hour standards, respectively. CEG is proposing to mitigate the ROC increases at Carson by surrendering banked Emission Reduction Credits (ERCs). The proposed ERCs are shown in Air Quality Table 6 (CEG 1999b). The Unocal ERCs are from the Sacramento Delta region upwind of the Carson facility. The Swansons ERCs are from a dry cleaning facility from the metropolitan area of Sacramento, just downwind of the Carson facility. Table 6 demonstrates that on a daily basis, the ERCs mitigate the potential increase of ROC emissions at Carson, thereby mitigating any potential increase of ozone and PM10. Recommended conditions of exemption are attached to this amendment analysis.

Air Quality Table 6: Carson Ice-Gen Project Propose Emissions Increase and Mitigation (lb/day)					
Offset Source Project Emission	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Lbs/year
	90	91	92	92	
Unocal ERCs (lbs/QTR)	1,715.4	1,715.4	1,715.4	1,715.4	6,861.6
Swansons ERC (lbs/QTR)	894.6	923.6	952.6	952.6	3,723.4
TOTAL ERCs (lbs/QTR)	2,610	2,639	2,668	2,668	10,585.0
TOTAL ERCs (lbs/DAY)	29	29	29	29	---
Proposed ROC emission increase at Carson (lbs/DAY)	29	29	29	29	10,585
Net ROC increase	0	0	0	0	0

Source: CEG 1999a, CEG 1999b

CONCLUSIONS AND RECOMMENDATION

On a daily basis the ERCs are adequate to mitigate the proposed ROC increase at Carson. Staff recommends approval of the proposed amendment, with the proposed conditions of exemption. AQ-1 is revised to show the new ROC limit for the Carson facility. AQ-6 and AQ-7 are added to identify the ERCs that are being surrendered.

Recommended Conditions of Exemption

AQ-1 During operation of the CEG/CVFA Ice-Gen Project, which includes the LM6000 ;base load combustion gas turbine, duct firing burners, LM6000 peaking combustion gas turbine, and Marley cooling tower, and the three boilers and six flares at the Sacramento Regional Waste Water Treatment Plant,, (SRWTP), air emissions shall not exceed the following levels:

NOx – 365 lb/day	CO – 126 lb/day
SO2 – 655 lb/day	ROC– 96 125 lb/day
PM10 – 135 lb/day	

Verification: CEG/CVFA shall submit quarterly summaries of this data to the CEC CPM. The first summary shall be submitted at the conclusion of the first calendar quarter after commencement of commercial operation. Included in one of the quarterly summaries will be a copy of the results of the annual source test required by SMAQMD.

AQ-6: The Carson Ice-Gen project owner/operator shall surrender emissions reduction credits from Unocal in the amounts specified below:

- January through March – 1,715.4 lb/calendar quarter;
- April through June – 1,715.4 lb/calendar quarter;
- July through September – 1,715.4 lb/calendar quarter; and
- October through December – 1,715.4 lb/calendar quarter.

Verification: Within 45 days of adoption of this amendment, the project owner/operator shall provide the CEC CPM with copies of the ERCs surrendered to the District.

AQ-7: The Carson Ice-Gen project owner/operator shall surrender to the District emissions reduction credits from Swansons Cleaners in the amounts specified below:

- January through March – 894.6 lb/calendar quarter;
- April through June – 923.6 lb/calendar quarter;
- July through September – 952.6 lb/calendar quarter; and
- October through December – 952.6 lb/calendar quarter.

Verification: Within 45 days of adoption of this amendment, the project owner/operator shall provide the CEC CPM with copies of the ERCs surrendered to the District.

REFERENCES

California Air Resources Board (CARB). 1994 -1997. California Air Quality Data, Annual Summaries, California Air Resource Board, Aerometric Division, Sacramento, CA

Carson Energy Group (CEG) 1999a, CARSON COGENERATION PROJECT (92-SPPE-1), PETITION TO AMEND THE CONDITION OF EXEMPTION AQ-1, REVISION TO INITIAL PETITION (COVER LETTER CVFA 99-013, 4/9/99), July 9, 1999

Carson Energy Group (CEG) 1999b, Application for Small Power Plant Exemption for the Carson Energy Group and Central Valley Financing Authority's Combine Cycle Cogeneration Facility, Docket No. 92-SPPE-1, PETITION TO AMEND the Conditions of Exemption Air Quality 1, April 12, 1999

California Energy Commission (CEC) 1993a, COMMISSION DECISIONS, Application for Small Power Plant Exemption, Docket No. 92-SPPE-1, P800-93-007, June 23, 1993.

California Energy Commission (CEC) 1993b, Initial Study, Application for Small Power Plant Exemption, Carson Energy Group and Sacramento Municipal Utility District, Carson Ice-Gen Project, Docket No. 92-SPPE-1, April 1993.

Sacramento Metropolitan Air Quality Management District (District 1999), Permit Carson Energy Group and Central Valley Financing Authority, Permit Nos. 12830, 11017, 11018.